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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,466	06/29/2001	Ajit V. Sathe	219.40241X00	5280

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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 12/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/893,466

Applicant(s)

SATHE, AJIT V.

Examiner

Ishwar (I. B.) Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-39 and 46-64 is/are pending in the application.
- 4a) Of the above claim(s) 19,24-26,32,37-39,50,57 and 62-64 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-18,20-23,27-31,33-36,46-49,51-56 and 58-61 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 03 October 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. The restriction requirement is still maintained as explained in the previous action.

Drawings

2. The corrected or substitute drawings were received on October 3, 2002. These drawings are approved.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 53-64 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 53-64 are directly or indirectly depending upon claim 27 and are claiming an electronic system. But claim 27 is a packaged integrated circuit.

The examiner considered claims 53-64, directly or indirectly, depend upon claim 52 and rejection / election - restriction requirement applied accordingly.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14-18,20-23, 27-31, 33-36, 46-49, 51-56 and 58-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim et al., US Patent No. 6,020,221, hereafter referred to as Lim, and further in view of Ho, US Patent No. 6,287,890.

Regarding claims 14, 27 and 46 Lim discloses an integrated circuit printed circuit board carrier package having a substrate and a stiffener to provide stiffening support to the substrate, (substrate 14 with stiffener member 20, semiconductor flip chip package or die 12, see figure 2-8, column 4, line 40-50). Though, Lin does not disclose explicitly, whether the substrate is coreless or thin core, Lin discloses that substrate can be made of any known material including polyamide tape, column 5, line 55-60, and the polyamide tape will be inherently a thin substrate. Further, Ho discloses a thin film built up multiplayer circuit for mounting high-density IC semiconductor devices. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the package of Ho with a thin film / thin core substrate as, as taught by Ho, in order to mount high density IC semiconductor device.

Regarding claim 52, though Lin does not disclose the electric system where the claimed substrate with the stiffener is used, the system with receiving socket and the other input / output device is known in the art, and is shown by the applicant as a background example, figure 1. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an electronic system with the modified package of Lim in order to have high density integrated circuit package.

Regarding claims 15, 28, 47 and 53 the modified assembly of Lim further discloses flip chip ball grid array carrier package (see figure 8, column 3, line 57-60).

Regarding claims 16, 29, 48 and 54 the modified assembly of Lim further discloses the stiffener member stamped from a metallic material (column 5, line 18-24).

Regarding claims 17, 30, 49 and 55 the modified assembly of Lim further discloses the stiffener being planar for mounting to a die-side major planar surface of the substrate (see figure 8).

Regarding claims 18, 31 and 56 the modified assembly of Lim further discloses an internal window in the stiffener (see figure 8).

Regarding claims 20, 33 and 59 the modified assembly of Lim further discloses the above substrate height of the stiffener equal to that of the above substrate height of the semiconductor chip (see figure 8).

Regarding claims 21, 34 the modified assembly of Lim further discloses top surface of the stiffener co-planar with the top surface of the semiconductor chip (see figure 8).

Regarding claim 22, 35, 51 and 60 the modified assembly of Lim further discloses, the stiffener can co-support a heat sink as shown in figure 8, a protective layer 44 fabricated of a metal such as copper.

Regarding claims 23, 36 and 61 the modified assembly of Lim further discloses stiffener made of copper, which is conductive with an epoxy resin layer in-between (column 4, line 40-50, see figure 8).

Response to Arguments

5. Applicant's arguments filed October 3, 2002 have been fully considered but they are not persuasive. Applicant argues that Lin does not mention thin core or coreless substrate. Lin discloses a substrate which can be made by any known material including polyamide tape, Lin column 5, line 55-60, and such thin polyamide tapes can be used for the substrate. Also, Ho discloses a thin film substrate for high-density semiconductor

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device package. Applicant further argues that the substrate claimed is of a new technology directed to a very specific technologies of thin core and coreless and submit an appendix showing a bumpless build up layer grown around an embedded silicon die, but such detail of the substrate is not claimed and in the last paragraph of the appendix, it is further disclosed that it is in the early stage of the development / exploration and status of such substrate in the art is not established.

Conclusion

6. Applicant's amendment necessitated the new ground(s) / new explanation of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ho, Bhatt et al., Tsukamoto, Karnezos, Bhatt et al., Nady, II et al., Goto et al., Crompton, III et al., Ho et al., disclose circuit board / package similar to applicant's claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (6:30 - 4) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 305 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp
December 5, 2002


ALBERT W. PALADINI
PRIMARY EXAMINER